

1.1 PURPOSE

The goal of the Monitoring Program is to develop information to support effective watershed stormwater quality management programs. The purpose of these management programs is to reduce pollutants in stormwater discharges to the maximum extent practicable. The major objectives of the Monitoring Program outlined in the Municipal Permit are to:

- track water quality status, pollutant trends and pollutant loads, and identify pollutants of concern;
- monitor and assess pollutant loads from specific land uses and watershed areas;
- identify, monitor, and assess significant water quality problems related to stormwater discharges within the watershed;
- identify sources of pollutants in the stormwater runoff;
- identify and eliminate illicit discharges;
- evaluate the effectiveness of management programs, including pollutant reductions achieved by implementation of Best Management Practices (BMPs); and
- assess the impacts of stormwater runoff on receiving waters.

The Monitoring Program, developed to address these objectives, has several elements: Mass Emission runoff monitoring; Land Use runoff monitoring; and Critical Source runoff monitoring. Each element conducted in 1999-2000 is described in Section 1.3, including the Permit objectives it addressed.

1.2 REPORT ORGANIZATION

The station selection process and the stations used in the Monitoring Program are described in Section 2.1. Maps and tabular descriptions of the tributary areas of each monitored watershed are displayed as Figures 2-1 through 2-14. The field and laboratory methods used in the program are presented in Section 3. The hydrologic and water quality results of the 1999-2000 storm season monitoring are described in Section 4, and the conclusions and recommendations based on the 1999-2000 results are presented in Section 5.

Runoff hydrographs from all the monitoring stations and rainfall contour maps are presented in Appendix A. The complete water quality data for the 1999-2000 season are provided in Appendix B and Appendix C contains tables of available data from the Los Angeles Regional Water Quality Control Board of the Industrial Stormwater Sampling Program. Appendix D is a table of monitoring costs incurred, and Appendix E contains a list of people to contact for more information.

Appendices C and D, though not specifically required by the Municipal Stormwater permit, are included here in the interest of information sharing.

Los Angeles County was the primary author of this report having performed the bulk of the data and statistical analyses and writing much of the report. URS Greiner Woodward Clyde's role was primarily to compile and edit text and assist with conclusions and recommendations.

1.3 BACKGROUND

The 1994-95 storm season was the first for which stormwater monitoring was required under the 1990 Los Angeles County NPDES Municipal Stormwater Permit No. CA0061654. During the 1994-95 and 1995-96 seasons, automated and manual sampling was conducted to characterize stormwater quality and quantity in accordance with the 1990 Municipal Permit. The 1994-95 monitoring data is summarized in *Report of Stormwater Monitoring, Winter of 1994-95* (LACDPW, 1996).

The 1996-97 season was the first storm season in which stormwater monitoring was conducted under the new 1996 Municipal Permit (No. CAS614001). For the 1996-97 season the scope of the Monitoring Program was expanded to incorporate further data collection and new pilot studies. The one-year pilot studies, consisting of “Wide Channel” and “Low Flow” analyses, were completed and reported in the *Los Angeles County 1996-97 Stormwater Monitoring Report, July 15, 1997* (LACDPW and Woodward-Clyde, 1997).

The monitoring program, including the Mass Emission, Land Use, and Critical Source elements continued in the 1997-98, 1998-99, and 1999-2000 storm seasons.

At the request of the National Resources Defense Council, this report includes the latest results (Appendix C) of the industrial stormwater permit sampling within the county.

1.3.1 Mass Emission Monitoring Program

Five mass emission-monitoring stations were utilized for the Monitoring Program during the 1999-2000 storm season. Mass emission stations capture runoff from major Los Angeles County watersheds that generally have heterogeneous land use. These stations monitor flow and have automated samplers to collect composite samples during storm events. Grab samples are also taken at these stations in accordance with the Municipal Permit. At least ten storms were sampled at each mass emission site. The last storm of April 17, 2000 is not included in this report. The objectives of the mass emissions stations are to update estimated pollutant loads to the ocean and to identify long term trends in pollutant concentrations, if possible.

1.3.2 Land Use Monitoring Program

Seven land use stations were monitored during the 1999-2000 storm season. The land use monitoring program is a result of a site selection study entitled *Evaluation of Land Use Monitoring Stations* (Woodward-Clyde and Psomas and Associates, 1996). The study identified the most significant land use categories within the permit area regarding stormwater quality. The drainage area tributary to each land use monitoring station is comprised predominantly of a single land use and is relatively homogeneous. The seven land use categories that were monitored represent over 86% of all the land use within the permit area. These stations monitor flow and have automated samplers to collect flow weighted composite stormwater samples during storm events. The major objectives of this monitoring effort are to evaluate the effects of certain land uses on water quality, to identify the relative importance of specific land uses as pollution sources, and to provide data that can be used to project watershed loads from watersheds that do not have mass emission stations.

The 13 storms of the 1999-2000 season yielded 82 land use station-events. The last storm of April 17, 2000 is not included in this report.

The retail/commercial sampling site on Pier Drain in Santa Monica (S08) was dismantled and not in use in the 1999-2000 season, with prior approval from the RWQCB, to accommodate construction by the City of Santa Monica of its stormwater treatment plant.

1.3.3 Critical Source/BMP Program

The Critical Source/BMP Monitoring study was designed to analyze baseline stormwater quality and assess the effectiveness of BMP implementation for critical industries and businesses. A number of critical source industries were identified and ranked by their potential significance to stormwater quality (Woodward-Clyde, 1997) and are listed in the following table:

Industrial Category	SIC Code	Industrial Stormwater Permits*
• Wholesale trade (including scrap yards and auto dismantling)	50	Yes
• Automotive repair/parking	75	No
• Fabricated metal products (including electroplating)	34	Yes
• Motor freight (including trucking)	42	Yes
• Chemical manufacturing facilities	28	Yes
• Automotive dealers/gas stations	55	No
• Electric/gas/sanitary	49	No
• Miscellaneous manufacturing	39	Yes

* Industrial facilities requiring general industrial stormwater permits.

Each critical source industry monitoring plan involves a multi-year study of stormwater runoff from six sites (three test sites and three control sites). During the first year of each study, runoff is sampled and analyzed from five storms to establish background levels. During subsequent years, BMPs are installed (see Table 4-8) at three of the six sites (test sites). BMP effectiveness is estimated from monitoring data gathered from the pooled test sites and pooled control sites during ten additional storms. A complete study plan is included in *Critical Source Selection and Monitoring Report* (Woodward-Clyde, 1997). Sites at six automotive repair shops, six auto dismantlers, six fabricated metal shops, six motor freight companies, and six auto dealers were monitored during the 1999-2000 storm season.

The required minimum of 5 storms were sampled at the motor freight companies and automobile dealers. Due to the prevalence of small, low intensity storms during the 1999-2000 season, the remaining sites only produced sufficient runoff from 6 to 9 of the required 10 storms.